

# Scanning the Past

## John S. Stone and the Professionalization of Communications Engineering

Eighty years ago this month, the PROCEEDINGS OF THE RADIO ENGINEERS (IRE) included a paper by John Stone concerning oscillations in electric circuits. At the time he was a self-employed communications consultant in New York City and the immediate past president of the IRE. As one of the first practicing engineers to apply sophisticated mathematical analysis to the improvement of communications systems, Stone (See Fig. 1) played a significant role in the emergence of communications engineering as a profession.

Stone was born in Dover, VA, in 1869. He spent his childhood in Europe and Egypt, where his father, a former U.S. Army general, helped modernize the Egyptian Army. In 1886, Stone enrolled in the School of Mines at Columbia University, New York, but in 1888 he transferred to Johns Hopkins University, Baltimore, MD, where he devoted two years to the study of physics and electrical engineering. He spent the summer of 1889 in Paris, France, in charge of an exhibit of the American Bell Telephone at the Paris Exposition.

In 1890, Stone joined the technical staff of the American Bell Telephone Company in Boston, MA, where he worked until 1899. During this period, he did both theoretical and experimental work related to wire telephony and wireless communication. He introduced Oliver Heaviside's transmission line theory to his fellow engineers and corresponded with Heaviside concerning applications of the theory. Stone received about 20 U.S. patents during his decade with the company, including an 1897 patent on the use of bimetallic wire with high self-induction to facilitate impedance matching. He also patented the Stone common battery system for use in telephony and experimented with the use of resonant circuits to enable multiplex transmission. His work set the stage for the introduction of loading coils and wave filters by a former assistant, George A. Campbell.

Stone was a consulting engineer in Boston from 1899 to 1902 when he founded the Stone Telegraph and Telephone Company to manufacture and market a system of wireless communication. Fig. 2 shows the typical schematic diagram of a Stone wireless telegraphic system and Fig. 3 shows the typical layout of apparatus in the telegraphic station.



Fig. 1. John S. Stone, a pioneer in wireless telegraphy, was a founder of the Society of Wireless Telegraph Engineers and a co-founder of the IRE. (Reproduced from *A Century of Electricals*, IEEE Press, 1984.)

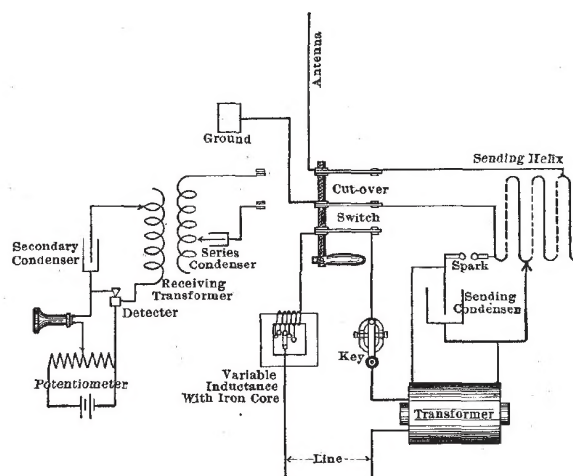


Fig. 2. This is a schematic for a complete wireless telegraph station, designed around a cut-over switch which switches the antenna from sending circuitry on the left to receiving apparatus on the right. (Reproduced from *Principles of Wireless Telephony* by George W. Pierce, McGraw-Hill, 1910.)

He presented a paper on the theory of wireless telegraphy at the International Electrical Congress in St. Louis, MO, in 1904. He also gave lectures on electric oscillations and resonance at the Massachusetts Institute of Technology. As